

I CLAIM:

1. An orthodontic device for use with orthodontic arch wires comprising:
  - a device body having labial, lingual, gingival, occlusal, mesial and distal surface portions, the body having therein a mesial-distal extending arch wire receiving slot having one side open to a device body surface portion to permit insertion of an arch wire 5 into the slot and its removal therefrom;
  - a pivot member mounted by the device body and establishing a corresponding mesial-distal extending pivot axis; and
  - a shutter member mounted by the pivot member for pivoting movement about the pivot axis between a slot open position in which the open slot side is open, and a slot 10 closed position in which the shutter member closes the open slot side to retain an orthodontic arch wire in the slot;

wherein the shutter member comprises:

  - a pivot portion mounted by the pivot member for the pivoting movement of the shutter member;

15 a slot closure portion movable with the pivot portion, extending mesially distally with respect to the device body, and in the slot closure position closing the slot open side; and

latch means having latch members cooperating with one another and operative between the pivot member and the pivot portion when the shutter member is in slot 20 closed position to retain the shutter member in that position.
2. An orthodontic device as claimed in claim 1, wherein the cooperating latch means members comprise a recess in one of the pivot member and the pivot portion, and a projection from the other of the pivot member and the pivot portion, and wherein with the shutter member in the slot closed position the recess and the projection are 5 cooperatively engaged with one another to retain the shutter member in that position.
3. An orthodontic device as claimed in claim 2, wherein the recess is provided in the

pivot member and the projection is provided on the pivot portion.

4. An orthodontic device as claimed in claim 1, wherein the shutter member pivot portion comprises a part thereof embracing the pivot member, the pivot portion part having a mesial distal extending bore therein through which the pivot member extends whereby the part has a wall of at least approximately annular transverse cross section 5 surrounding the pivot member;

the wall having therein a mesial distal extending radial slot from its interior to its exterior so that the wall is discontinuous around the pivot member and has a movable segment thereof able to move radially toward and away from the pivot member by flexing thereof; and

10 wherein one of the latch means members is carried by the movable segment and moves into and out of engagement with the other of the latch means members by the flexing of the movable segment.

5. An orthodontic device as claimed in claim 4, wherein the movable segment constitutes from about 200° to 270° of the total circumference of the pivot portion part wall with the respective latch means member disposed immediately adjacent to the radial slot.

6. An orthodontic device as claimed in claim 1, wherein the shutter member pivot portion comprises a part thereof embracing the pivot member, the pivot portion part having a mesial distal extending bore therein through which the pivot member extends whereby the part has a wall of at least approximately annular transverse cross section 5 surrounding the pivot member;

the wall having therein a mesial distal extending radial slot from its interior to its exterior so that the wall is discontinuous around the pivot member and has a movable segment thereof able to move radially toward and away from the pivot member by flexing thereof; and

10 wherein one of the projection and the recess of the latch means members is

carried by the movable segment and moves into and out of engagement with the other of the recess and the projection by the flexing of the movable segment.

7. An orthodontic device as claimed in claim 4, wherein the radial slot in the pivot portion part has a tool receiving aperture therein through which a tool may be inserted by an operator for flexing of the movable segment to disengage the projection and recess for movement of the shutter member out of the slot closed position.
8. An orthodontic device as claimed in claim 7, wherein the pivot member comprises a single pivot pin and the tool receiving aperture is continued into the pin to permit adequate insertion of the tool into the aperture.
9. An orthodontic device as claimed in claim 7, wherein the pivot member comprises two separate coaxial pins having their facing ends spaced apart to permit insertion of the tool between them.
10. An orthodontic device as claimed in claim 4, wherein the movable segment has a part thereof adjacent to the location of the respective latch means member extending radially outward and engageable with a surface of the device body to limit the movement of the shutter member beyond a desired slot open position.
11. An orthodontic device as claimed in claim 1, wherein in the slot closed position of the shutter member the mesial and distal ends of the slot closure portion engage with immediately adjacent surface portions of the device body with an interference fit engagement between them providing a retaining force such that in addition to the latch means the shutter member is also constrained thereby in the slot closed position against movement out of that position, and movement of the shutter member into the slot closed position requires flexing of the slot closure portion in a direction away from the device body against the resilience of the material of the slot closure portion.

12. An orthodontic device as claimed in claim 1, and comprising an attitude controlling spring member within the device body having a fixed end portion fixed against movement relative to the device body and a free end portion extending into the arch wire receiving slot for engagement in a mesial-distal extending plane with an arch 5 wire in the slot, such engagement urging the arch wire toward the slot closure part.

13. An orthodontic device as claimed in claim 12, wherein the attitude controlling spring member is of thin metal sheet with at least one transversely extending side arm, and is retained within the device body by having one or both of the side arms sandwiched between a part of the device body containing the arch wire slot and a base 5 member fastened to the device body.

14. An orthodontic device as claimed in claim 1, and comprising an attitude controlling spring member constituted by a flexible portion of the shutter member that with the shutter member in slot closed position has a free end portion extending into the arch wire receiving slot for engagement in a mesial-distal extending plane with an arch 5 wire in the slot, such engagement urging the arch wire into engagement with the respective slot walls

15. An orthodontic device as claimed in claim 14, wherein in the slot closed position the flexible portion of the shutter member is positively engaged with a surface of the device body so as preload the flexible portion and urge the free end portion toward engagement with an arch wire in the arch wire slot.

16. An orthodontic device as claimed in claim 14, wherein the flexible portion of the shutter member is of recurved cross section in an occlusal, gingival, labial, lingual plane, and in slot closed position is engaged by lateral walls of the device body parallel to the last-mentioned plane to protect it against mesial or distal directed stresses 5 applied thereto.

17. An orthodontic device as claimed in claim 2, wherein in the slot closed position of the shutter member the mesial and distal ends of the slot closure portion engage with immediately adjacent surface portions of the device body with an interference fit engagement between them providing a retaining force in addition to the latch means such that the shutter member is also constrained thereby in the slot closed position against movement out of that position, and movement of the shutter member into the slot closed position requires flexing of the slot closure portion in a direction away from the device body against the resilience of the material of the slot closure portion.

18. An orthodontic device as claimed in claim 2, and comprising an attitude controlling spring member within the device body having a fixed end portion fixed against movement relative to the device body and a free end portion extending into the arch wire receiving slot for engagement in a mesial-distal extending plane with an arch wire in the slot, such engagement urging the arch wire toward the slot closure part.

19. An orthodontic device as claimed in claim 18, wherein the attitude controlling spring member is of thin metal sheet with at least one transversely extending side arm, and is retained within the device body by having one or both of the side arms sandwiched between a part of the device body containing the arch wire slot and a base member fastened to the device body.

20. An orthodontic device as claimed in claim 4, wherein in the slot closed position of the shutter member the mesial and distal ends of the slot closure portion engage with immediately adjacent surface portions of the device body with an interference fit engagement between them providing a retaining force in addition to the latch means such that the shutter member is also constrained thereby in the slot closed position against movement out of that position, and movement of the shutter member into the slot closed position requires flexing of the slot closure portion in a direction

away from the device body against the resilience of the material of the slot closure portion.

21. An orthodontic device as claimed in claim 4, and comprising an attitude controlling spring member within the device body having a fixed end portion fixed against movement relative to the device body and a free end portion extending into the arch wire receiving slot for engagement in a mesial-distal extending plane with an arch 5 wire in the slot, such engagement urging the arch wire toward the slot closure part.
22. An orthodontic device as claimed in claim 21, wherein the attitude controlling spring member is of thin metal sheet with at least one transversely extending side arm, and is retained within the device body by having one or both of the side arms sandwiched between a part of the device body containing the arch wire slot and a base 5 member fastened to the device body.
23. An orthodontic device as claimed in claim 1, and for application to the lingual surface of an incisor or canine tooth, which teeth are characterized in that their labial-lingual dimension decreases progressively from the gingival to the occlusal; wherein in the slot closed position the occlusal surface portion of the shutter 5 member is flush with the occlusal surface portion of the device body to thereby provide a combined occlusal surface which is unobstructed; and wherein the gingival-occlusal dimension of the device body decreases progressively from the labial to the lingual, the decrease corresponding to the average increase from the occlusal to the gingival of an incisor or canine tooth, so that when the 10 bracket is attached to the lingual surface of an incisor or canine tooth the unobstructed combined occlusal surface provides a labial-lingual extending bite plane surface which a tooth edge of an opposed incisor or canine tooth can engage during biting action to oppose overbite.
24. An orthodontic device for use with orthodontic arch wires comprising:

a device body having labial, lingual, gingival, occlusal, mesial and distal surface portions, the body having therein a mesial-distal extending arch wire receiving slot having one side open to a device body surface portion to permit insertion of an arch wire 5 into the slot and its removal therefrom;

a pivot member mounted by the device body and establishing a corresponding mesial-distal extending pivot axis; and

a shutter member mounted by the pivot member for pivoting movement about the pivot axis between a slot open position in which the open slot side is open, and a slot 10 closed position in which the shutter member closes the open slot side to retain an orthodontic arch wire in the slot;

wherein the shutter member comprises:

a pivot portion mounted by the pivot member for the pivoting movement of the shutter member;

15 a slot closure portion movable with the pivot portion, extending mesially distally with respect to the device body, and in the slot closure position closing the slot open side; and

an attitude controlling spring member constituted by a flexible portion of the slot closure portion that with the shutter member in slot closed position has a free end 20 portion extending into the arch wire receiving slot for engagement in a mesial-distal extending plane with an arch wire in the slot, such engagement urging the arch wire into engagement with the respective slot walls.

25. An orthodontic device as claimed in claim 24, wherein in the slot closed position the flexible portion of the slot closure portion is positively engaged with a surface of the device body so as preload the flexible portion and urge the free end portion toward engagement with an arch wire in the arch wire slot.

26. An orthodontic device as claimed in claim 24, wherein the flexible portion of the slot closure portion is of recurved cross section in an occlusal, gingival, labial, lingual plane, and in slot closed position is engaged by lateral walls of the device body parallel

to the last-mentioned plane to protect it against mesial or distal directed stresses  
5 applied thereto.

27. An orthodontic device as claimed in claim 24, and including latch means having  
latch members cooperating with one another and operative between the pivot member  
and the pivot portion when the shutter member is in slot closed position to retain the  
shutter member in that position.